



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/649,590	08/27/2003	Ole Henrik Waagaard	WEAT/0493	4986
36735	7590	01/11/2006	EXAMINER	
PATTERSON & SHERIDAN, L.L.P. 3040 POST OAK BOULEVARD, SUITE 1500 HOUSTON, TX 77056			ROJAS, OMAR R	
			ART UNIT	PAPER NUMBER
			2874	

DATE MAILED: 01/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/649,590

Applicant(s)

WAAGAARD ET AL.

Examiner

Omar Rojas

Art Unit

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 October 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 17-20 is/are allowed.
- 6) ☒ Claim(s) 1-3, 8-10, 15 and 16 is/are rejected.
- 7) ☒ Claim(s) 4-7 and 11-14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1005.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☒ Other: Detailed Action.

DETAILED ACTION

Response to Amendment

1. With regards to the amendment filed on August 10, 2005, all the requested changes to the claims and specification have been entered. Claims 1-20 are pending.

Response to Arguments

2. Applicant's arguments with respect to claims 1-3, 8-10, and 15-16 have been considered but are moot in view of the new ground(s) of rejection.

Information Disclosure Statement

3. The prior art documents submitted by applicant in the Information Disclosure Statement(s) filed on October 17, 2005 have all been considered and made of record (note the attached copy of form(s) PTO-1449).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

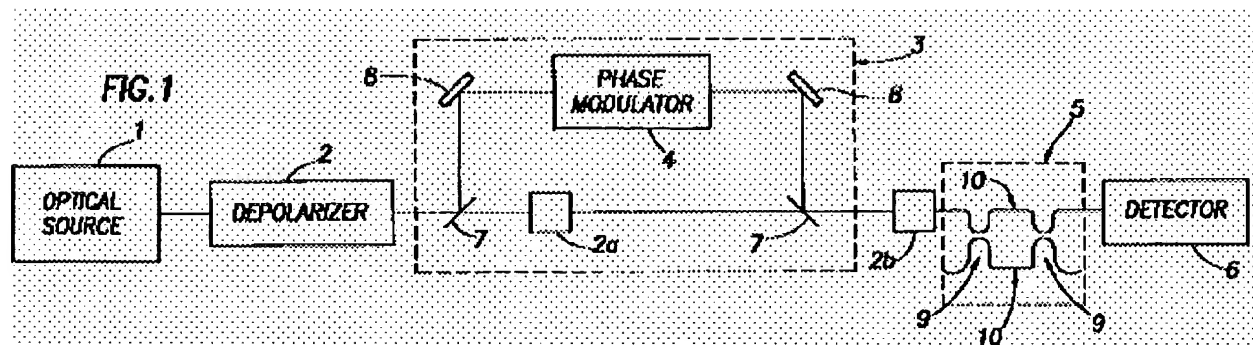
invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-3, 8-10, and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over USP 6,195,162 B1 to Varnham et al. ("Varnham") in view of Tselikov (USP 6,574,015), both previously made of record.

Regarding claims 1 and 8, the Varnham patent discloses an interferometric sensor comprising:

a depolarizer 2; and

first and second reflectors 7 coupled to the output of the depolarizer 2 to form an interferometer, wherein the reflectors 7 are spaced from one another to provide an interference signal (col. 4, lines 35-37). Figure 1 of Varnham is reproduced below.



Regarding claims 2 and 9, Varnham discloses a light source 1.

Thus, Varnham differs from claims 1, 2, 8, and 9 in that Varnham does not disclose that his depolarizer 2 comprises a beam splitter, a beam combiner, and first and second polarization maintaining fibers ("PMFs") as recited by claims 1 and 8. Note, however, that Varnham

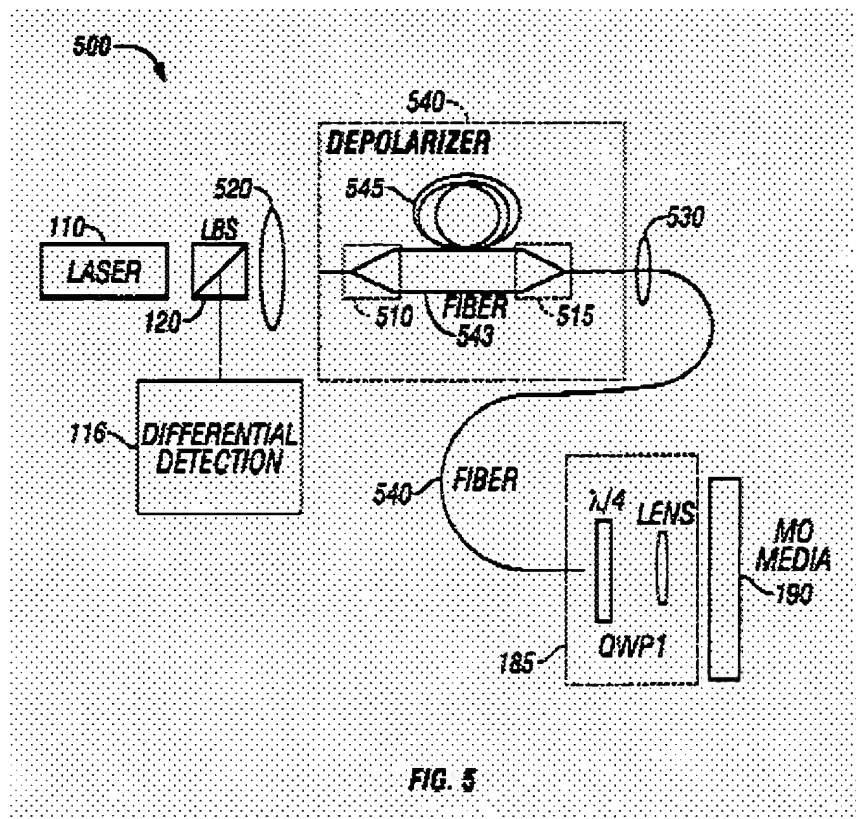
Art Unit: 2874

specifically states that "any convenient depolarizer" may be used in his invention (col. 4, ll. 37-39).

Tselikov, as discussed in the previous Office action discloses a depolarizer 540 comprising:

a beam splitter **510** having an input and two outputs, where a light beam from a first output has a polarization that is orthogonal to a polarization of a light beam from a second output; and

a beam combiner **515** having a first input coupled to the first output of the beam splitter via a first fiber **543**, a second input coupled to the second output of the beam splitter via a second fiber **545**, and an output that produces depolarized light, where the first and second fibers are polarization maintaining fibers and the second fiber **545** has a length that provides a predefined delay with respect to the first fiber such that a parasitic interference signal having a delay equal to the predefined delay will be suppressed during a demodulation process (see column 5, lines 52-67 and column 7, lines 13-42). Figure 5 of Tselikov is reproduced below.



One motivation for combining Tselikov with Varnham is given in column 2, lines 6-9 of Tselikov (i.e., minimizing mode-partition noise).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to obtain the invention specified by claims 1, 2, 8, and 9 in view of Varnham combined with Tselikov.

Regarding claims 3 and 10, as seen in Fig. 1 of Tselikov, a polarization controller 130 is provided between a light source 110 and a beam splitter for equalizing signal power levels. As noted by Tselikov, the same principles of his disclosure apply to different embodiments (col. 3, lines 19-23). Therefore, when the depolarizer 540 of Tselikov is combined with Varnham to

Art Unit: 2874

meet the limitations of claims 1, 2, 8, and 9, it would have also been obvious to use the polarization controller 130 disclosed by Tselikov to obtain the invention specified by claims 3 and 10.

Regarding claims 15 and 16, the recited method steps merely recite the functional operation of the device limitations disclosed by claims 1, 3, 8, and 10. Since Varnham in view of Tselikov discloses all the device limitations of claims 1, 3, 8, and 10, the functional operation of Varnham in view of Tselikov as applied to claims 1, 3, 8, and 10 also renders obvious the method of claims 15 and 16.

Allowable Subject Matter

7. Claims 17-20 are allowed.

8. Claims 4-7 and 11-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claims 4-5, 11-12, and 17-18, the primary reason for allowance of the claims is the inclusion of a light source having a coherence length that is less than a length of an interrogation pulse that is formed using the depolarized light.

Regarding claims 6-7, 13-14, and 19-20, the primary reason for allowance of the claims is the inclusion of a light source having a frequency swept output and the predefined delay is selected to ensure that a cross-correlation between orthogonal polarizations of the source do not appear in extracted signal frequencies within a receiver.

Art Unit: 2874

The aforementioned light sources appear to have particular significance for use in time division multiplexing ("TDM") and frequency division multiplexing ("FDM") applications, as disclosed by applicant(s).

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Omar Rojas whose telephone number is (571) 272-2357. The examiner can normally be reached on Monday-Friday (12:00PM-8:00PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rod Bovernick, can be reached on (571) 272-2344. The official facsimile number for regular and After Final communications is (571) 273-8300. The examiner's RightFAX number is (571) 273-2357.

Art Unit: 2874

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Omar Rojas
Patent Examiner
Art Unit 2874

or
January 7, 2006



AKM ENAYET ULLAH
PRIMARY EXAMINER